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## PHARMACOLOGICAL EVALUATION OF ANTIBACTERIAL ACTIVITY OF NEEM EXTRACT

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### Abstract:-

Azadirachta indica (Neem) that could be a Mother of all medical care plant has been used extensively several decades past and still been exploitation for ritual and medicative functions. It's straightforward convenience and low price has allowed many of us to achieve have the benefit of this dynamic plant. Studies are done wide from the leaves up to its bark to explore its therapeutically potentials. The chemical science like organic compound, Nimbidin, Nimbin, Nimbinin, Nimbidinin, Nimbolide, Nimbidic acid, Nimbidin and Na Nimbidate derived from the Azadirachta indica plant poses style of pharmacologic effects like antipyretic, antiviral, analgesic, antibacterial drug, contraceptive and hepatoprotective impact and lots of a lot of. so this review shows the active part and pharmacologic and non pharmacologic uses of Azadirachta indica.

**Keywords:** - Azadirachta indica, Azadirachtin, nimbidin, Pharmacological activities.

### 1. Introduction:-

Azadirachta indica (NEEM) usually called arishth belongs to the family of rosid dicot family. It's used as ayurvedic treatment for over 4000 years ago and its usage was recorded around 4500 years ago. Arishth is employed in ancient drugs as a supply of the many therapeutic agents within the Indian culture and grows well within the tropical countries. Its twigs giva manduction stick and are wide utilized in the Indian sub continent earlier studies on arishth have showed that it contains active substances with multiple healthful properties<sup>1</sup>. Nim tree in traditional knowledge drugs for the treatment of polygenic disorder and show the potential role of opposing diabetic activity. Binary compound extract of arishth leaf extract features a smart therapeutic potential as opposing hyperglycemic agent in IDDM and ketoacidosis-resistant diabetes mellitus. That anti-inflammatory impact of arishth extract is a smaller amount than that created by anti-inflammatory. Arishth leaves has medicine properties and will be used for dominant mobile microorganism contamination within the residential premise Supports the employment of the arishth seeds in ancient drugs to treat infections conditions particularly those involving the attention and ear. Administration of alcoholic extract of arishth flower disrupts the polyoestrous cycle in Sprague Dawley rats and causes a partial block in organic process and has the potential of a perfect prophylactic agent. The good potential arishth binary compound extract as powerful chemotherapeutical and infective agent. The aim of this study was to research the antimicrobial activity of arishth leaves against human moribific bacterium, as well as E. coli, genus Pseudomonas aeruginosa, salmonella, staphylococci aureus, and eubacterium pumilus<sup>33</sup>.

Arishth (Azadirachta indica) has historically been thought-about one among the foremost versatile healthful plants that possesses a good spectrum of biological properties as well as anti-inflammatory, anti-arthritic, anti-pyretic, anti-gastric lesion, medicine, antifungal, antiviral, inhibitor, antimalarial drug, medication and antineoplastic activities. During this study, the agar disc diffusion methodology was accustomed verify the medicine activity of ethanolic arishth leaf extract against 3 staphylococci aureus isolates from

completely different sources that are human skin, snake mouth and cow milk, staphylococci epidermidis, Micrococcus sp., eubacterium sp., and genus Serratia sp. arishth leaf extract at concentrations of four-hundredth, hour and eightieth were used with negative managements of water and grain alcohol further as a positive control of Penicillin-G antibiotics. Inhibition zones were discovered once 24-hour incubation, of the arishth leaf extract the least bit concentrations to all or any Gram-positive bacterium that are *S. aureus*, *S. epidermidis*, *Micrococcus* sp. and *eubacterium* sp. *eubacterium* sp. was shown to possess the very best sensitivity to the arishth leaf extract<sup>33</sup>. The biggest zones of inhibition were discovered at the eightieth concentration of arishth leaf extract altogether bacterium excluding genus *Serratia* sp. Gram-negative bacterium genus *Serratia* sp. was immune to the medicine effects of the arishth leaf extract<sup>1</sup>

## 2. Materials and Methods: -

### Extract preparation:-

Leaves of tree were collected from trees growing at intervals the University Putra country, Malaysia, campus. The collected tree leaves were fully washed with water to urge obviates dirt<sup>19</sup>.

Twenty grams of tree leaves was then shade dried and ground well by pattern mixer grinder. The powder was then place into a filter bag and water was superimposed. Compound extract was collected by pressing the bag manually<sup>5</sup>.

Binary compound extract was prepared in 10, 25, 50, 100 and 2 hundred mg mL<sup>-1</sup> concentration. Another portion of the up to date tree leaves was merging to urge the juice of the leaves. The juice was mixed with water to make into fully totally different concentration: 10, 25, 50 and 75%. Hundred p.c concentration was jointly prepared whereas not combine with water<sup>7</sup>.

Bacteria:- *Vibrio parahaemolyticus* and *vibrio alginolyticus* were isolated from cultured shrimp and maintained at the Aquatic Animal Health Unit, University Putra Asian nation and utilized during this experiment. All cultures subsequently grownup from hold on stocks were brinded to urge single colony before use. The bacteria were cultured on troptic soy agar (TSA; Merck, Germany) plates and incubated at 37°C<sup>30</sup>.

### Agar plate preparation for sensitivity test: -

Cardinal grams of Mueller-Hinton agar powder (Merck, Germany) was suspended in one L of H<sub>2</sub>O at the facet of thirty g of common salt (3% NaCl) and autoclaved at 121°C for fifteen min. The agar was allowed to chill right down to 62°C during a } very water tub before running into Petri dish

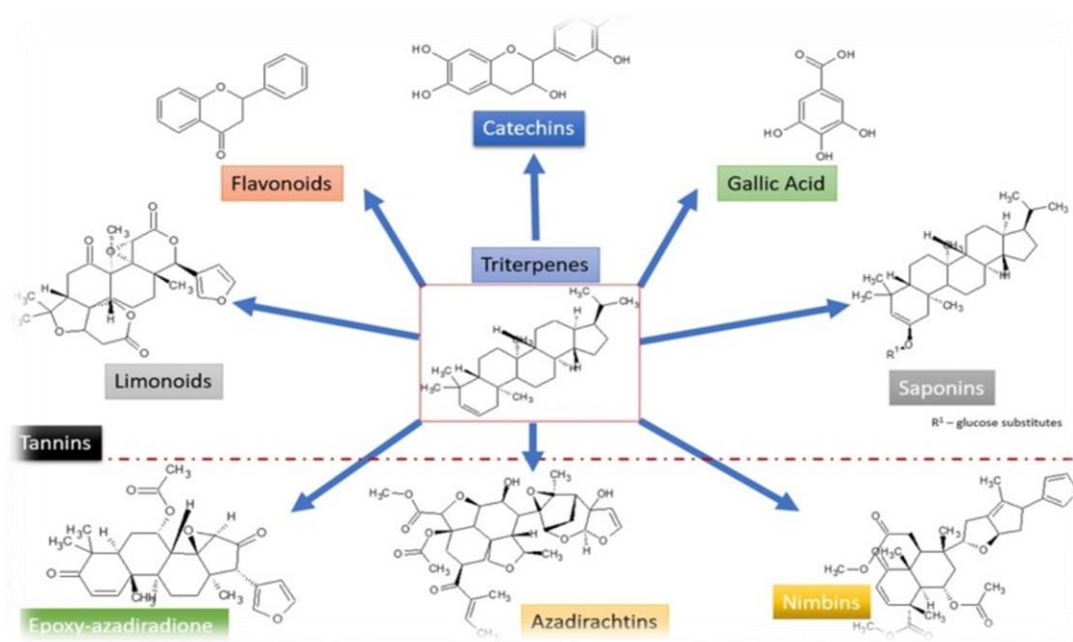


Fig 1. Derivatives of Triterpenes

Table 1. Scientific classification of neem tree

S.N	Classification	Name
1	Kingdom of neem	Plantae
2	Sub-Kingdom of neem	Tracheobionta
3	Domain of neem	Eukaryota
4	Class of neem	Magnoliopsida (Dicotyledons)
5	Order of neem	Sapindales
6	Phylum of neem	Spermatopyta (seed plant)
7	Subhylum of neem	Angiospermae
8	Family of neem	Meliaceae
9	Genus of neem	Azadirachta A.Juss (azadirachta)
10	Species of neem	Azadirachta, Indica



Fig 1. Neem tree fig

### 3. Common Names :-

- English name – Indian , Neem
- Franch name – margousier , azidarac, azadira
- Portuguese name - margosa (goa)
- Spanish name – Nim , margosa
- German name – Niembaum
- Hindi name – Neem , nimb
- Burmese name – Tamarkha , Tamar
- Urdu name – Neem , Nim
- Punjabi name – Neem
- Tamil name – Veppan , Vembu
- Sanskrit name – Nimbou , Nimba , Arishtha
- Latin name – Azadirachta indica
- Kannada name: Bemu, Bevinamara.
- Sindi name – Nimmi
- Sri Lanka name - Kohomba
- Farsi name - Azad darakhti hindi (free tree of India), nib
- Malay name - Veppa
- Singapore: kohumba, nimbi
- Indonesia name - Mindi
- Nigeria name - Dongoyaro
- Kiswahili name -Mwarubaini (muarobaini)



**Fig 2. Neem leaf fig**

Neem leaf is employed for infectious disease, eye disorders, bloody nose, internal organ worms, indigestion, loss of appetite, skin ulcers, diseases of the guts and blood vessels (cardiovascular disease), fever, diabetes, gum illness (gingivitis), and liver issues. The leaf is additionally used for contraception and to cause abortion. The bark is employed for protozoal infection, abdomen and internal organ ulcers, skin diseases, pain, and fever.

### 4. Parts of neem: -

#### 4.1 Seeds:-

There is a placing similitude between the fruit of the arishth and olives. Notably, the seed contains over one kernel that have five hundredth oil content. This oil has associate degree array of healing properties, and its extracts are used extensively for making many merchandise starting from attention merchandise to insect repellents.



**Fig 4.1. Neem Seeds**

#### **4.2 Leaves :-**

There are many uses of neem tree leaves. The extracts of the leaves are wide employed in tending and hair care product and have additionally found its thanks to dentifrice and mouthwashes. Also, it's used as ayurvedic medication for dominant glucose level, cleansing blood and strengthening the system.



**Fig 4.2 . Neem leaves**

#### **4.3 Barks:-**

Neem bark incorporates a high proportion of active ingredients, antiseptic and anti inflammatory properties. Within the aid field, the bark is taken into account to be an efficient medication for treating periodontal disease.



**Fig 4.3. Neem barks**

#### **4.4. Flowers :-**

Its flowers have a sweet and noticeable smell. In fact, the oil from neem tree flowers is employed extensively in aromatherapy and is believed to own a soothing and therapeutic result. Also, the honey made up of this flower is kind of valued for its varied health advantages



Fig 4.4.Neem flowers

#### 4.5 Pulp :-

Even when the extraction of oil from the *Melia Azadirachta* seeds, its pulp is often used as mulch or compost to treat the soil. It's helpful in neutralising acidic soil and in rising its overall quality. Also, it is often fed to animals as food.

In a shell, the neem has an associated degree array of properties. Such properties don't simply facilitate combat many health issues however also are used extensively to treat skin-related problems <sup>2</sup>.

#### 5. Properties:-

Neem oil is acrid, yellow, bitter in style and includes a disagreeable garlic like odour. It's pungent odour. It's colourless clear liquid. The residue of margosa obtained by steam distillation contains a biological process germicidal substance known as alkyl group disulfide chemical compound.

#### I Neem Composition:

##### A Neem fruit (fish)

1	Brown, kernels, greenish	30%
2	Pulp, other shell ,etc	70%

##### B Neem seed

Kernel	55.30%
Shell	44.70%

C Neem kernel oil content: - 46-48%

##### D Other ingredients

1 Azadirachtin	0.30%
2 Nimbidin	1.2-1.6%
3 Nimbin	0.10%
4 Nimbinin	0.01%
5 Vepinin	0.15%

##### II Components weight in fruit (percentage)

Skin & pulp	48%
Kernel	17%
Seed	35%

Kernels constituting about 45% of the seed contain 40% to 45% oil.

## III. Properties of neem oil

## Neem oil properties

1. Colour	greenish brown
2. Odour	garlic repulsive
3. Refractive index at 40 Degree celsius	1.14617 – 1.46270
4. Specific gravity at 30 Degree celsius	0.9087 – 0.9189
5. Titer degree Celsius	35 – 36
6. Iodine value	68.0 – 75.8
7. Saponification value	193 – 204
8. 1Ns. No	128
9. Unsaponifiable matter	0.8 – 2.4%

## Fatty Acide Percentage

1. Myristic Acid	0.2 – 2.6
2. Arachidic Acid	0.8 – 3.4
3. Linoleic Acid	2.3 – 15.8
4. Palmitic Acid	13.6 – 16.2
5. Stearic Acid	14.4 – 24.1
6. Oleic Acid	49.1 – 61.9

Physical-chemical Properties	Neem oil
Colour	Golden yellow
Refractive index	1.5301
pH	5.53
Nature at room temperature	Liquid
Moisture content (%)	0.05%
Specific gravity at 25°C	0.9382(G/cm)
Acid value (mg/g)	1.980
Iodine value (mg /g)	69.780
Sauponification value (mg/g)	176.30
%FFA	1.0
Ester value	174.32

**5.1 Ayurveda properties of Neem:**

Rasa – style – Bitter (tikta) and astringent (kashaya)

Guna– qualities – lightweight to digest (Laghu), Dry (rooksha)

Vipaka– pungent once digestion. – Katu Vipaka

Veerya– efficiency – Cold in nature.

### 5.1.1 Uses of Neem According to Ayurveda:

Helps in polygenic disease, lowers the blood sugar levels

- Helps in skin diseases like skin disease, skin problem or skin disorder
- Helps to get rid of microorganism and infection
- Increases immunity
- Balances tyrannid and Kapha
- Helps in Nausea/vomiting
- Relieves worms
- Helps to alleviate eating disorder (Aruchi)
- Due to opposed microorganism properties, it's useful in fever

## 6. Conclusion:-

As antimicrobial resistance to artificial medication and drugs continues to be a dreadful and worrisome challenge within the medical field, unraveling and exploring the untapped nutritious and medicative wealth of leaves, roots and herbs remains a potent alternative in unhealthful recalcitrant infection/disease inflicting microorganisms. During this study, antimicrobial activity and phytochemical constituents of tree leaves and lemon grass oil extracts were evaluated and the results unconcealed that ethanolic tree oil extracts had highest activity against fungus albicans that may be a plant. supported the chosen microorganisms that embrace gram positive bacteria, gram negative microorganism and fungi, ethanolic lemon grass extracts had a lot of considerable activity against wider vary of microbes. Ethanolic lemon grass oil and ethanolic tree leaves oil had totally different activity towards the microorganisms; alcohol and dissolvent extracted tree leaves oils had totally different antimicrobial behavior and additionally, the susceptibleness of the microbes to the industrial tree oil and also the laboratory solvent extracted tree oil was totally different. These indicate that many factors have an effect on susceptibleness of microbes to antimicrobial agents. Five photochemical were detected within the tree leave oil extract whereas four photochemical were detected within the lemon grass oil extract. The synergistic actions of the photochemical are very wish to be chargeable for the varied opposing – antiseptic and opposing – plant life properties exhibited by the oils. it's prompt that a lot of analysis efforts ought to be geared towards understanding the mechanisms of antimicrobial susceptibleness of the organism as this may improve the probabilities of arising with novel product which might effectively combat apparently drug resistance microbes..

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